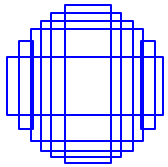
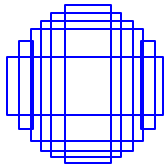


Technology Service Corporation

Surveillance for Airport Perimeter Security

Presented at the
NASA I-CNS Conference, 2 May 2002
By Ann S. Barry
Technology Service Corporation (TSC)



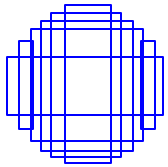
Technology Service Corporation

Introduction

Objective: Use of existing Airport Surface Detection Equipment- Model 3 (ASDE-3) radar systems as a cost-effective enhancement to existing and planned security measures for detecting intruders on the airport surface.

Topics:

- Program Concept
- Program Evolution
- Program Description



Technology Service Corporation

Program Concept (1 of 2)

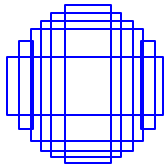
- Use existing airport surface surveillance radar (specifically, the ASDE-3) for detecting un-authorized personnel on the airport surface
- Develop a stand-alone, concept-verification prototype Airport Security Display Processor (ASDP) system to serve as an adjunct security sensor

Technology Service Corporation

Program Concept (2 of 2)

- Airport surface surveillance radar (ASDE-3) is suited for intruder detection and tracking
  - Installed at 34 major US airports
  - Scans entire airport once per second
  - Works in all weather, day and night
  - Proven human detection capability
    - Ku-band, 0.25° Az.BW, 40 ns pulse width
  - Provides perimeter and airport surface surveillance

Typical ASDE-3 Radar System Installation



Technology Service Corporation

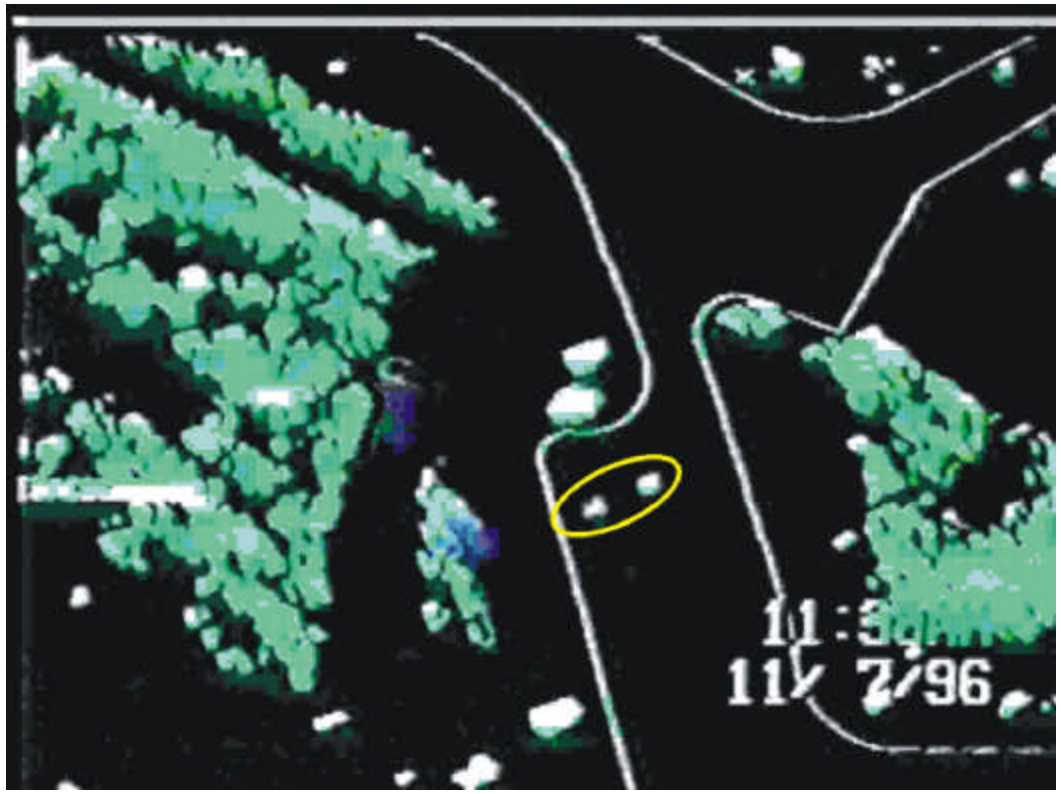
Program Evolution

- Proof-of-Concept test at John F. Kennedy International Airport (JFK)
- FAA Research Grant
  - Security Requirements Assessment
  - ASDE-3 Performance Modeling
  - JFK ASDE-3 Detection Performance Analysis
- TSWG Development Program
  - Airport Security Display Processor (ASDP) prototype development
  - Concept demonstration using representative ASDE-3 data
  - Real-time operation demonstration at JFK Airport

Technology Service Corporation

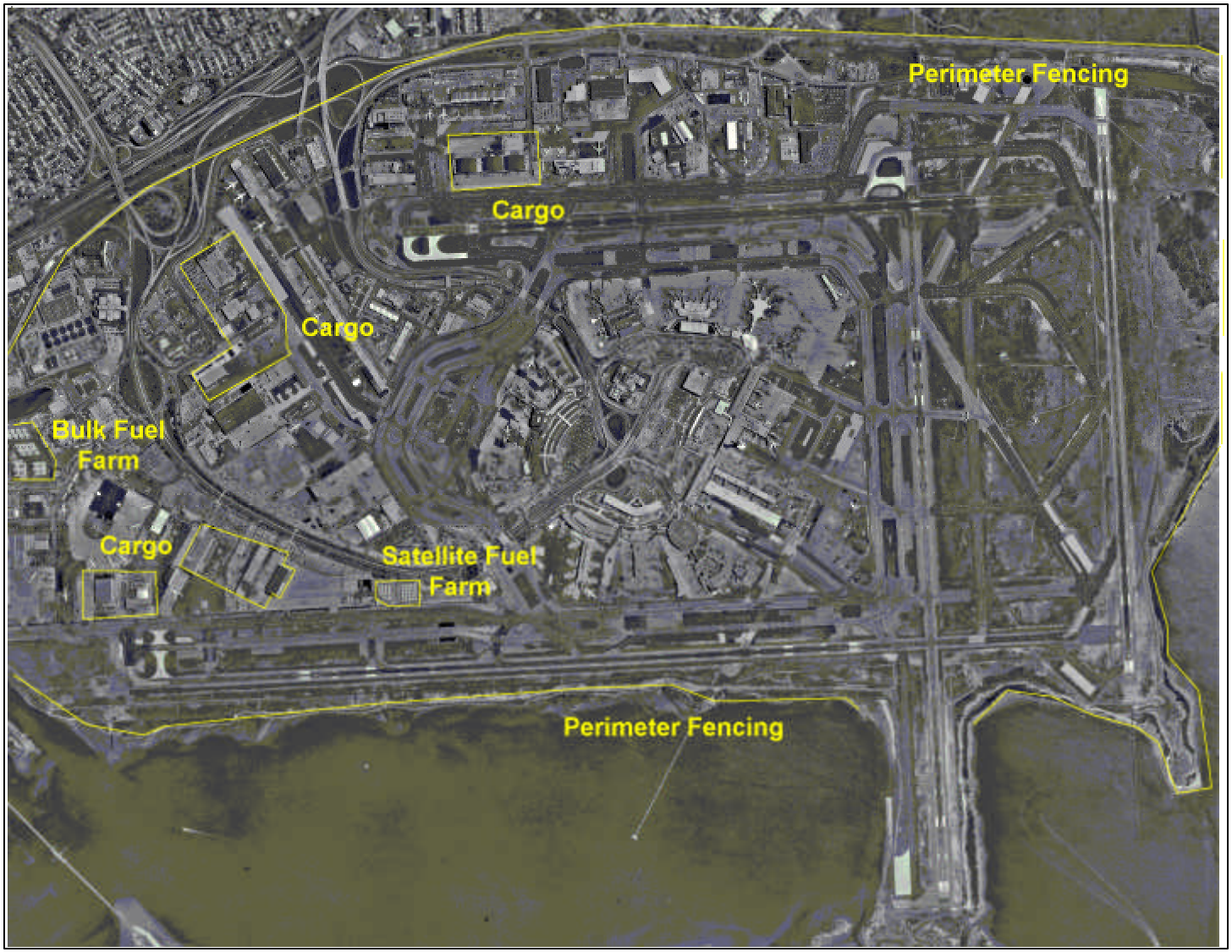
Proof-of-Concept Test

Airport personnel on JFK runway as detected by ASDE-3 radar system during the proof-of-concept test



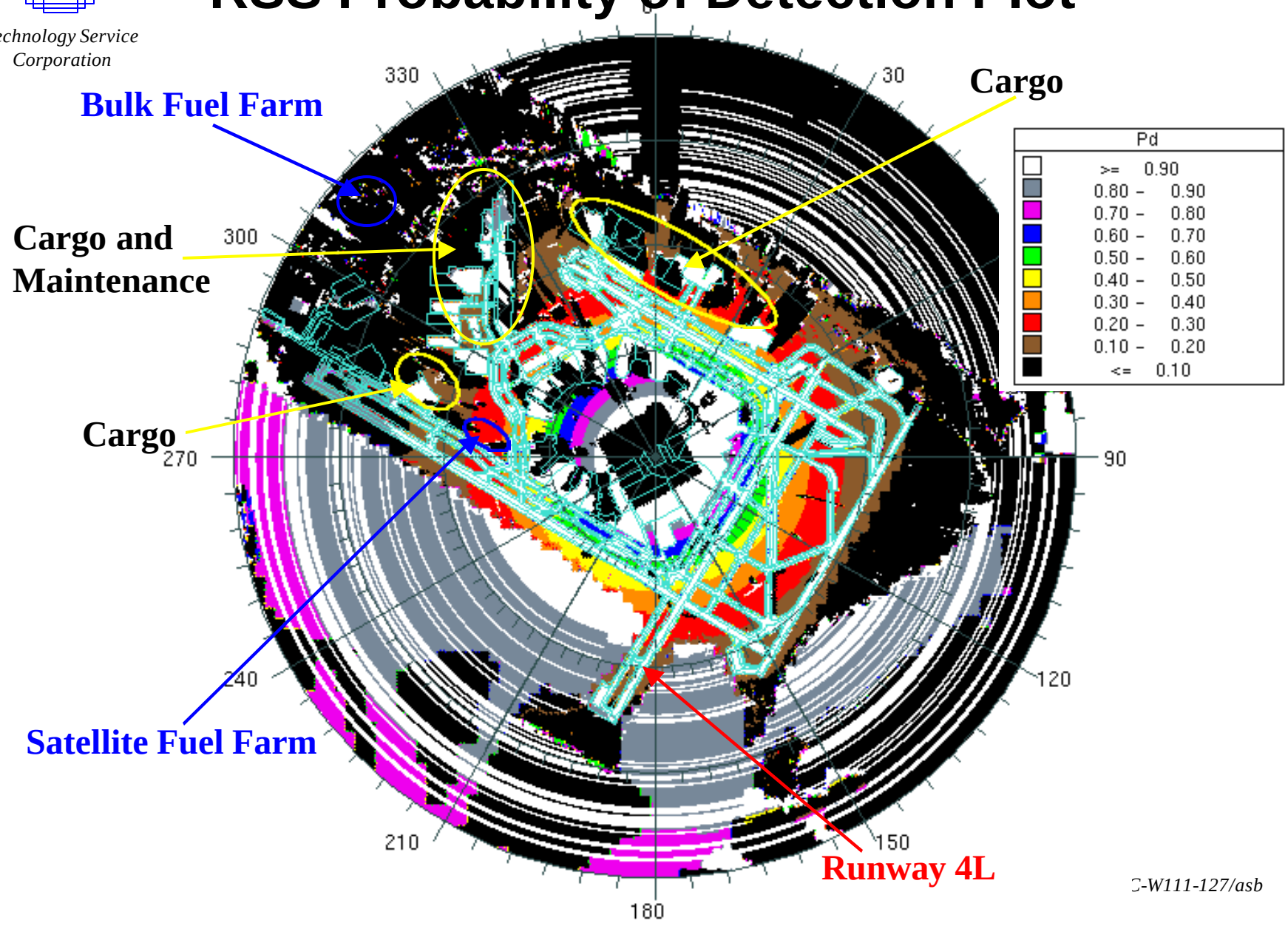
Identification of JFK Features

Technology Service Corporation



JFK Performance Analysis
RSS Probability of Detection Plot

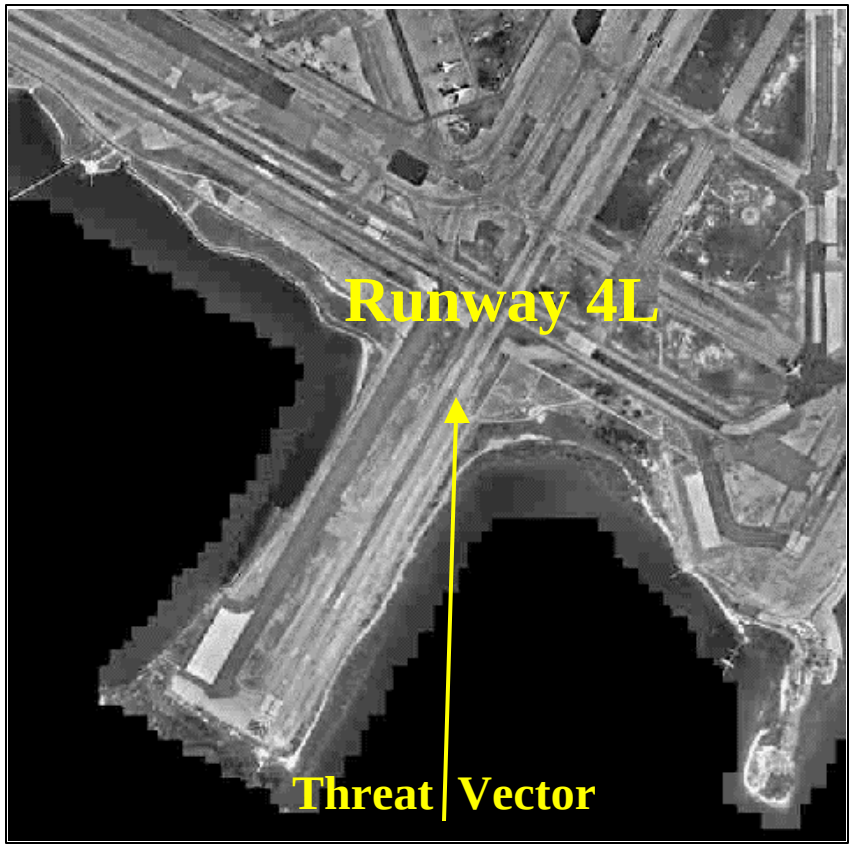
Technology Service Corporation

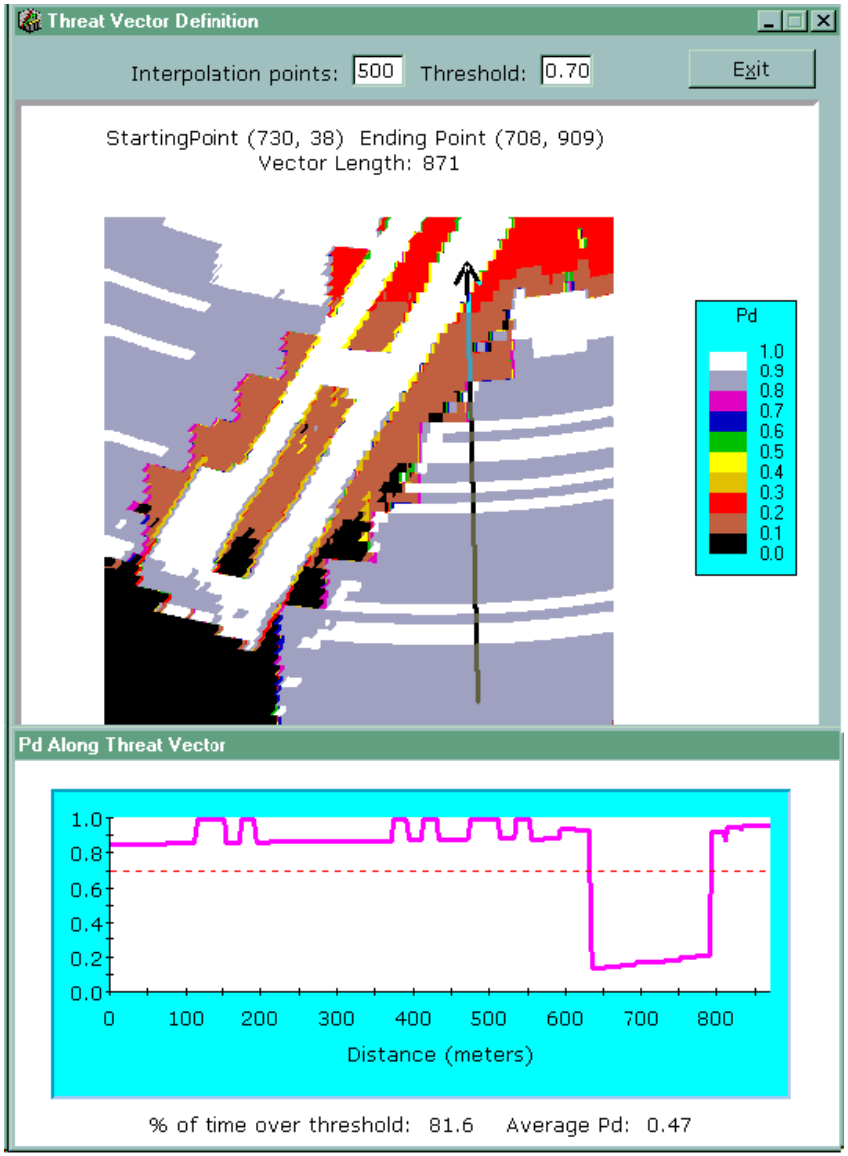


C-W111-127/asb

JFK Threat Vector Analysis

Technology Service Corporation

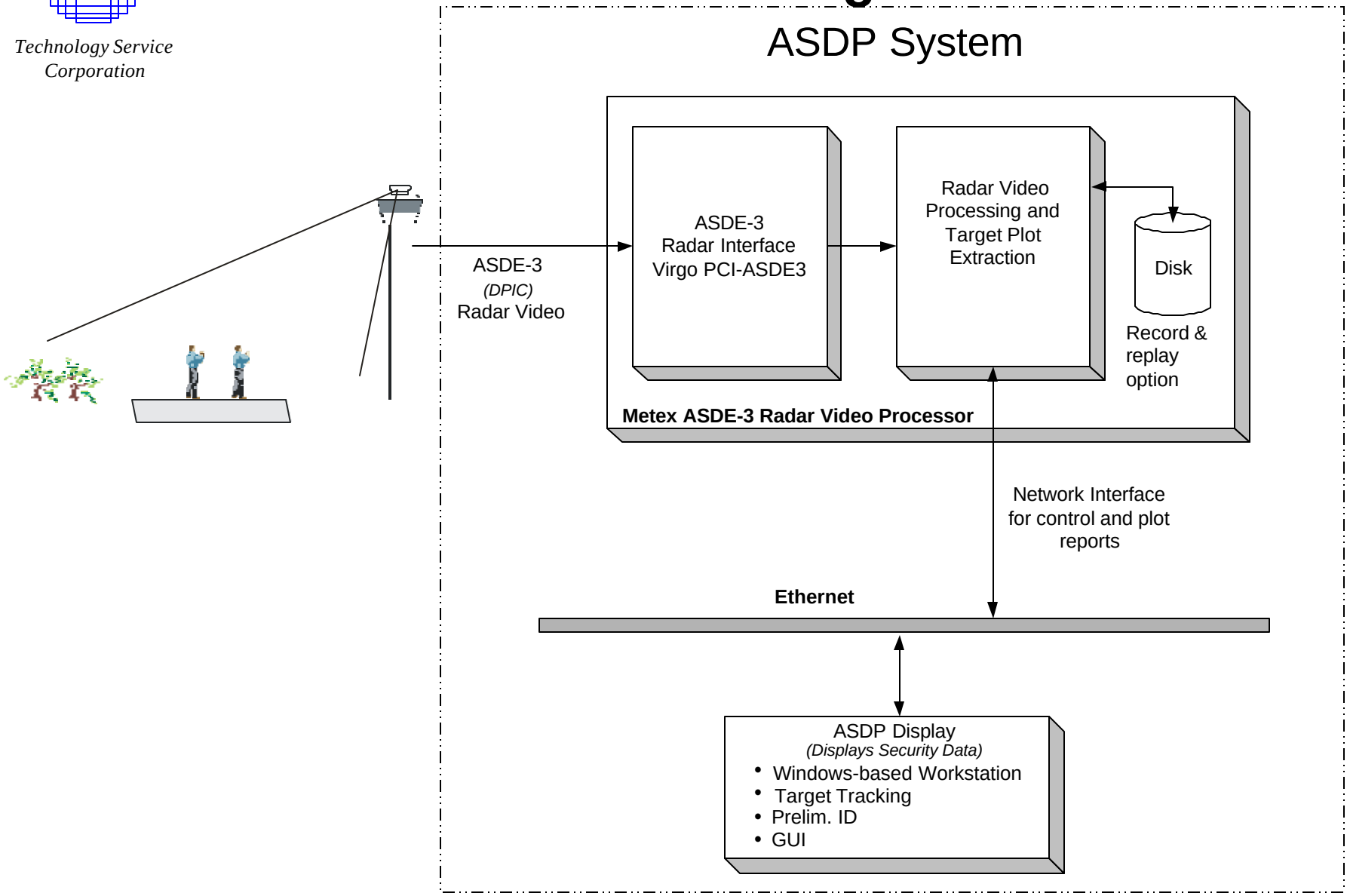




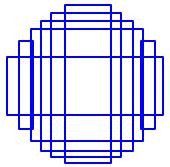
TSC-W111-127/asb

Program Description
ASDP Block Diagram

Technology Service Corporation



TSC-W111-127/asb



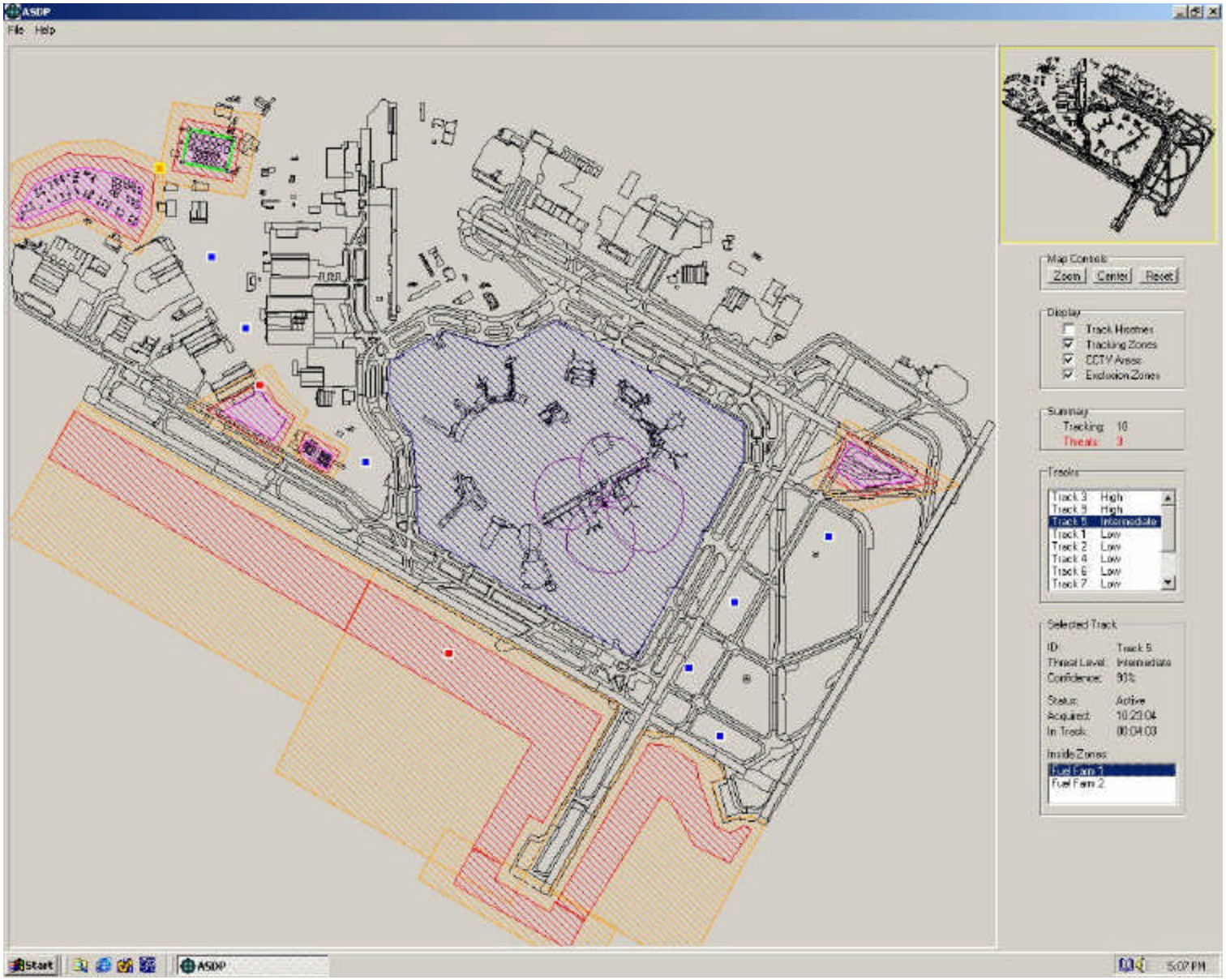
Technology Service Corporation

ASDP System Development

- Generated System Requirements Document
  - Coordinate with security end-users
- Developed Intruder Target Tracking Algorithms
- Designed ASDP GUI

Technology Service Corporation

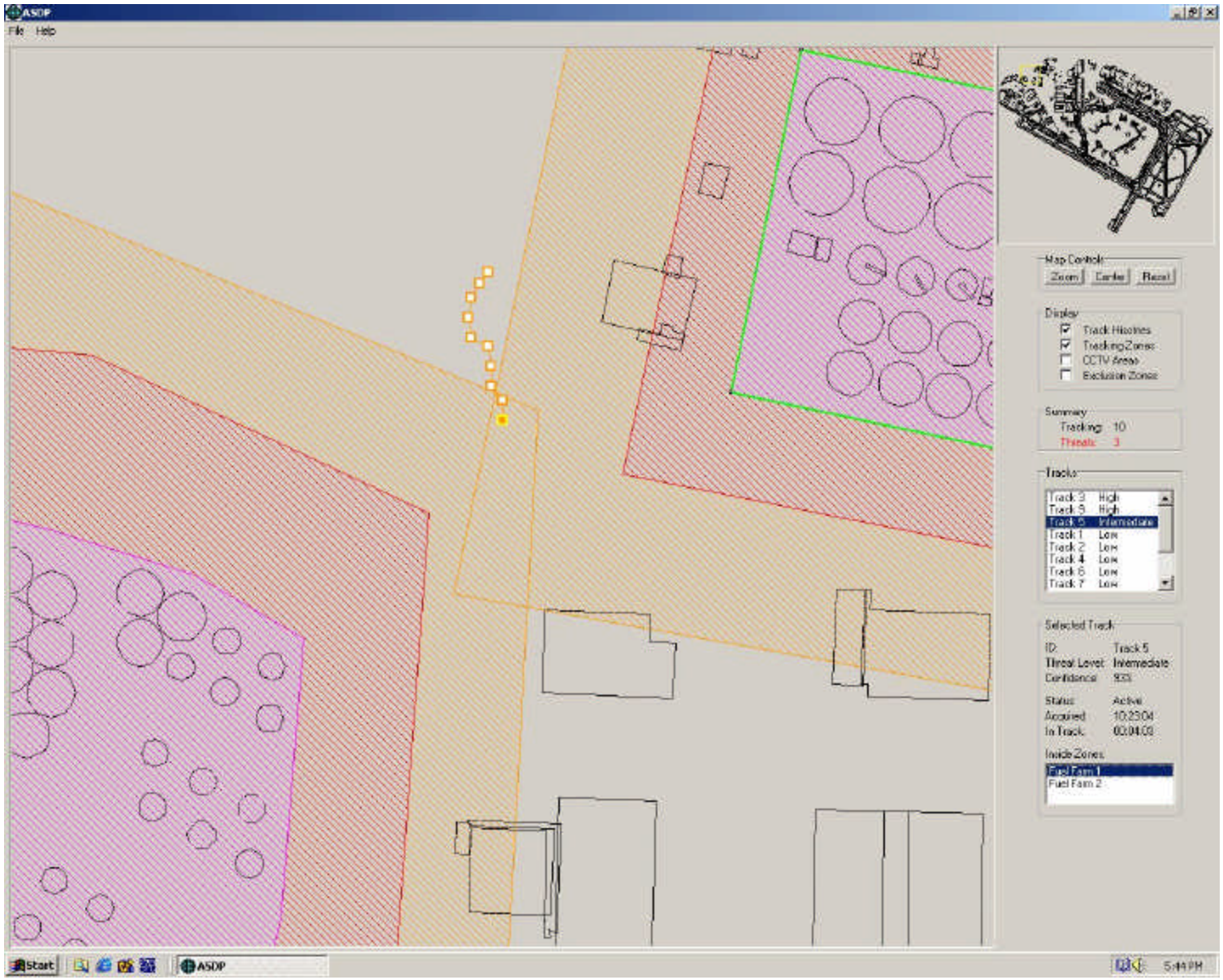
ASDP GUI Tracking Zones



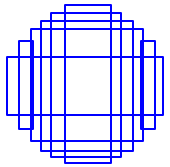
TSC-W111-127/asb

Technology Service Corporation

ASDP GUI Intruder Tracking



TSC-W111-127/asb



Technology Service Corporation

Summary

- ASDE-3 can serve as part of an airport security sensor suite
  - Covers entire airport surface, 24/7
  - Capable of detecting human size targets
- Initial concept verification completed by TSC
  - Security personnel surveyed for requirements at ASDE-3 airports
  - ASDE-3 detectability and coverage verified at key airports
- Prototype ASDP development in process
  - Initial demonstration with recorded ASDE-3 data
  - Final demonstration integrated with operational ASDE-3 at JFK